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# The Federal Nonnuclear Energy Research and Development Act (P.L. 93-577) Section 11 Environmental Evaluation. Background Document for National Hearings, October 3-5, 1979

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Energy, Minerals and Industry

EPA

# The Federal Nonnuclear Energy Research And Development Act (P.L. 93-577)

# Section 11, Environmental Evaluation

## Background Document For National Hearings

October 3-5 1979
Washington, D.C.

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Public Law 93-577
93rd Congress, S. 1283
December 31, 1974

# An Act

To establish a national program for research and development in nonnuclear energy sources.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,*

SHORT TITLE

Federal Nonnuclear Energy Research and Development Act of 1974. 42 USC 5901 note. 88 STAT. 1878

SECTION 1. This Act may be cited as the "Federal Nonnuclear Energy Research and Development Act of 1974".

ENVIRONMENTAL EVALUATION

42 USC 5910.

SEC. 11. (a) The Council on Environmental Quality is authorized and directed to carry out a continuing analysis of the effect of application of nonnuclear energy technologies to evaluate—

(1) the adequacy of attention to energy conservation methods; and

(2) the adequacy of attention to environmental protection and the environmental consequences of the application of energy technologies.

(b) The Council on Environmental Quality, in carrying out the provisions of this section, may employ consultants or contractors and may by fund transfer employ the services of other Federal agencies for the conduct of studies and investigations.

Hearings.

(c) The Council on Environmental Quality shall hold annual public hearings on the conduct of energy research and development and the probable environmental consequences of trends in the development and application of energy technologies. The transcript of the hearings shall be published and made available to the public.

Transcript, availability.

Report to President, Administrator, and Congress.

(d) The Council on Environmental Quality shall make such reports to the President, the Administrator, and the Congress as it deems appropriate concerning the conduct of energy research and development. The President as a part of the annual Environmental Policy Report required by section 201 of the National Environmental Policy Act of 1969 (42 U.S.C. 4341) shall set forth the findings of the Council on Environmental Quality concerning the probable environmental consequences of trends in the development and application of energy technologies.

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16. ABSTRACT

Under Section 11 of the Federal Nonnuclear Energy Research and Development Act, the Environmental Protection Agency is responsible for assessing "the adequacy of attention to energy conservation methods and environmental protection...and the environmental consequences of the application of energy technologies." The 1979 Section 11 activities examine the Department of Energy management process relating to environmental planning and assessment for energy technology projects.

This pre-hearing document summarizes the concerns and questions raised at a series of workshops held in July 1979 as well as EPA's own analysis of how environmental concerns are incorporated into DOE's Management System. The document is intended to provide a focus for further thought and discussion at a National Hearing in October 1979. The substance of the analysis and the discussions is to be used in completing the 1979 Section 11 Report to the President, the Secretary of Energy and Congress.

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## GLOSSARY

| | |
|---|---|
| **CEQ** | Council on Environmental Quality |
| **DOE** | Department of Energy |
| **EA** | Environmental Assessment |
| **ECC** | Environmental Coordination Committee |
| **EDP** | Environmental Development Plan |
| **EIS** | Environmental Impact Statement |
| **EPA** | Environmental Protection Agency |
| **ERD** | Environmental Readiness Document |
| **ESAAB** | Energy Systems Acquisition Advisory Board |
| **NEPA** | National Environmental Protection Act |
| **OEMI** | Office of Energy, Minerals, and Industry |
| **PEP** | Energy System Acquisition Project Environmental Plan |
| **PPMS** | Program and Project Management System |
| **RD&D** | Research, Development and Demonstration |

# EXECUTIVE SUMMARY

## Introduction

Under Section 11 of the Federal Nonnuclear Energy Research and Development Act (P.L. 93-577), the Environmental Protection Agency (EPA) has the responsibility for assessing *"the adequacy of attention to energy conservation methods and environmental protection . . . and the environmental consequences of the application of energy technologies."* Last year's Section 11 activities focused on the allocation of research, development, and demonstration resources by the Department of Energy (DOE). Witnesses at the public hearings were deeply divided over the proper allocation of these resources. They did not understand how DOE decides on particular allocations, and how environmental considerations enter the process.

This year the Section 11 activities will examine the DOE management *process*. We are specifically interested in the way information on "energy conservation methods and environmental protection" is used in technology development decisions. The Program and Project Management System (PPMS) was focused on because it provides for high-level management review of large energy technology projects before any budget commitments are made. An integral part of PPMS is the environmental planning and assessment process through which environmental concerns are identified, research needed to address those concerns is planned, and assessments of research results are made.

## Public Interaction

To provide an opportunity for a regional evaluation of the DOE Management System and its effect on projects which are being developed locally, a series of workshops were held in July 1979 in Atlanta, Denver, San Francisco, and Pittsburgh. They were attended by a wide range of representatives from federal, state, and local agencies, environmental and public interest groups, labor, industry, and the general public.

This pre-hearing document is intended to: (1) summarize the concerns and questions raised at the workshops and in EPA's own analysis of how environmental concerns are incorporated into the Department of Energy Management System, and (2) suggest topics for discussion at the October National Hearing. The information developed through EPA's analysis, the concerns expressed at the workshops and the testimony at the October Hearing will be used in completing this year's Section 11 Report to Congress.

## The DOE Technology Management Process

The Program and Project Management System is the principal DOE management system governing the development, approval, and execution of DOE's technology development programs. The basic purpose of the PPMS is to define and review projects before major resource commitments are made. Within PPMS comparisons between technologies are not made.

The PPMS was designed to facilitate the review of technical, economic, and environmental factors of each energy technology at specifically defined stages in its development. These reviews occur as technologies move in increasing scale from basic research through the pilot and demonstration stages, and ultimately to commercial facilities. This review is conducted by the Energy Systems Acquisition Advisory Board, made up of senior DOE officials including the Assistant Secretary for Environment. This Board makes recommendations to the DOE Under Secretary who determines whether a project should advance to the next stage of development.

To synchronize required environmental research with the development stages of particular technologies, DOE designed an environmental planning and assessment process within PPMS. The major aspects of this process are:

- *Planning*—Two documents define environmental concerns and research needs. Environmental Development Plans treat generic technologies such as oil shale processing or coal liquefaction, and Project Environmental Plans identify the research to be conducted at a specific DOE facility.

- *Review and Assessment*—Three documents are used to provide assessments of the research conducted. Environmental Readiness Documents are independent assessments by the Office of Environment which define the status of environmental issues affecting the further development of a technology. Environmental Assessments and Environmental Impact Statements, required by the National Environmental Policy Act, are prepared by the DOE Program Offices and are reviewed by the Office of Environment. To date only Environmental Impact Statements have received wide public distribution.

**Aspects of DOE's Decision-Making Process for Discussion**

The PPMS and the environmental planning and assessment process are intended to ensure environmentally responsible decision-making. As designed, the total process exhibits many aspects of an effective management system, and represents progress toward sound, environmentally responsible decision-making. However, concerns and questions were raised about the DOE decision-making process in the four regional workshops and in EPA's own analysis. These concerns center around five general issues:

1. **Appropriate Governmental Levels for Treating Environmental Issues**—The types of environmental concerns associated with a technology range from site-specific impacts (e.g., resource requirements, socioeconomic impacts) to national concerns (e.g., basic health effects of pollutants, development of environmental control technologies). For a technology to be made environmentally acceptable, environmental analysis should be carried out at all levels. The present DOE Management System does not make clear who is responsible for carrying out the analysis at the local and regional levels. A "tiered" arrangement may be possible in which the responsibility and authority for conducting analyses is given to the appropriate level. Environmental information from these levels should be available before federal decisions affecting those levels are made.

2. **Types of Projects Receiving Major Management Attention**—At present, DOE comprehensively reviews technology projects designated as "major systems acquisitions". Several criteria—most notably cost—are used to designate these major projects. Because of these criteria, smaller projects and some technology programs are not covered by the PPMS. Concerns voiced at the workshops dealt with ways to modify the PPMS criteria so that smaller projects which either have significant environmental impacts or benefits receive the appropriate high-level management attention.

3. **Criteria Used in Evaluating Individual Technologies**—Explicit environmental criteria should be developed and applied to *all* major decisions in DOE's management system. Specification of such criteria would help ensure that all important environmental factors are examined prior to decision-making, and that decisions across technologies are consistent.

4. **The Role of Non-DOE Groups in Evaluating Environmental Issues**—Workshop attendees were concerned about the lack of involvement of several non-DOE groups such as the public, industry, labor and state and local governments in DOE technology decisions. The concerns voiced at the workshops revolved around ensuring that adequate information is actively disseminated, and that the appropriate interests are heard and effectively considered at significant decision points.

5. **The Integration of Environmental Factors into Technology Decision Making**—Several workshop comments dealt with the need for better integration of technology and environmental planning and decision-making. Better integration might be achieved through: (1) allowing systematic environmental evaluations to play a greater role in technology development; (2) making better use of National Environmental Policy Act (NEPA) documents in planning and decision-making; and (3) designing pilot and demonstration projects to ensure maximum generation of technical and environmental research data.

The intent of this pre-hearing document is not to recommend a particular course of action to address these issues, but rather to synthesize comments, questions, and recommendations from the workshops and our own analysis, and thereby provide a focus for further thought and discussion at the National Hearings. The substance of these discussions will then be incorporated into the final Section 11 Report to Congress, scheduled for submission in January 1980.

# I. OVERVIEW OF SECTION 11 ACTIVITIES AND PRE-HEARING DOCUMENT

The Federal Nonnuclear Energy Research and Development Act (P.L. 93-577) was passed in December 1974 as part of the national response to the effects of the 1973 Arab Oil Embargo. The legislation created a comprehensive national research, development and demonstration (RD&D) program for nonnuclear energy technologies, which presently expends over $1.8 billion annually. Within P.L. 93-577, Section 11 directs an annual review of "... the adequacy of attention to energy conservation methods and environmental protection ... and the environmental consequences of the application of energy technologies." The Office of Energy, Minerals and Industry within EPA's Office of Research and Development has been assigned responsibility for the review and is charged with conducting annual public hearings and preparing a Report to the President and Congress.

Last year's Section 11 activities focused on the annual allocation of RD&D resources among competing energy technologies. These activities showed very deep differences of opinion on the proper allocation of resources. These differences reflect fundamentally conflicting views about the attractiveness of competing supply-oriented and conservation-oriented technologies. They also reflect conflicting views about the appropriate technology development stage for addressing environmental questions.

During the 1978 public hearings, witnesses expressed a lack of understanding of DOE's resource allocation process and the manner in which environmental considerations enter the process. Consequently, in fulfilling the responsibilities of Section 11 this year, EPA's activities have *not* stressed resource *allocations.* Rather, we are examining the management *process* used by the Department of Energy (DOE) to ascertain how this process addresses concerns for environmental protection and energy conservation. *This year the "adequacy of attention" will be evaluated not in terms of the relative share of the RD&D budget given to a technology, but rather in terms of how information on "conservation methods and environmental protection" is used in the major management decisions controlling DOE's research programs.*

The Program and Project Management System (PPMS) is DOE's major management process for its research, development and demonstration program. The PPMS is oriented toward major hardware projects, so a great deal of DOE's management effort is concerned with these projects. Within PPMS, an environmental planning and assessment process determines the environmental and health consequences of energy technologies, and guides the environmental research programs for these technologies. The PPMS, including this environmental assessment, is the fundamental management tool controlling the evolution of the RD&D program. Much of this year's Section 11 review has been devoted to examining PPMS and the associated environmental assessments.



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Information dissemination is a major component of the Section 11 activities. The 1979 Section 11 activities have included four regional public workshops where the DOE Management System was explained. These workshops provided an opportunity for a regional evaluation of the DOE Management Systems and its effect on projects which are being developed locally. The participants evaluated this system and expressed their own environmental concerns about specific energy technologies and projects.

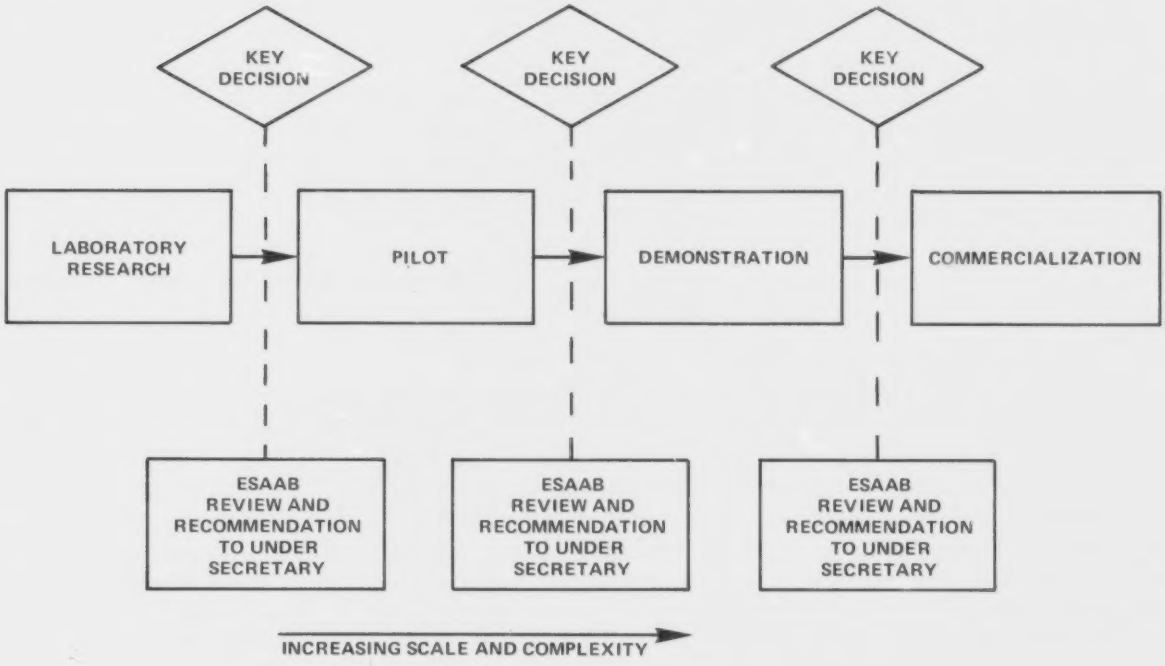
As part of the Section 11 activities, this pre-hearing document is intended to do three things:

- Outline the DOE decision-making processes, notably the Program and Project Management System and its environmental planning and assessment process (see Chapter II).
- Summarize the concerns and questions raised at the four Section 11 public workshops (see Chapter III).
- Suggest topics for discussion at the October 3-5 National Hearing in Washington, D.C. (see Chapter IV).

## II. ENVIRONMENTAL INPUT INTO DOE'S TECHNOLOGY MANAGEMENT PROCESS

### Overview of the Management Process

The Federal Nonnuclear Energy Research and Development Act of 1974 requires DOE to accelerate the development of alternative energy technologies consistent with national energy policy as laid out in the biennial National Energy Plans. In order to develop technologies that are technically feasible, economically practical, and environmentally acceptable, DOE conducts research, development, and demonstration (RD&D) programs. An emerging technology moves through several stages of increasing complexity and scale—laboratory, pilot, demonstration, and commercialization—as it progresses from basic research to commercial acceptance. At the end of each stage, a decision must be made whether or not to advance the technology to the next stage. This process is illustrated below:




ESAAB = Energy System Acquisition Advisory Board

FIGURE 1. MAJOR SYSTEM ACQUISITION DECISION POINTS

The Program and Project Management System (PPMS) is the principal DOE management system governing the development, approval, and execution of DOE's development programs. The basic purpose of PPMS is to facilitate the review of projects at the end of each development stage before major federal resources are committed. Technical, economic, and *environmental* concerns for a particular technology, are considered within PPMS, but no comparisons are made between technologies. This review is conducted by the Energy Systems Acquisition Advisory Board (ESAAB), made up of senior DOE officials, including the Assistant Secretary for Environment. As a result of its review, the Board makes recommendations to the DOE Under Secretary who determines whether a project should advance to the next stage of development. *Participation in the ESAAB is important to the DOE Office of Environment because it is a direct link to the development, approval, and execution of DOE's major technology projects.*

Only projects designated as "major systems" are reviewed by the Energy System Acquisition Advisory Board. DOE uses many factors to determine whether a project will be designated as a major system acquisition, including development cost*, technical complexity, projected market penetration of the technology, time of entry, energy input requirements, and relationships to energy supplies displaced or substituted. Of approximately 100 large nuclear and nonnuclear DOE technology RD&D projects now underway, only 20 to 30 are major systems; these account for about 50 percent of the total Department budget for energy RD&D.

DOE energy projects not designated major systems acquisitions are under the management responsibility and direction of the appropriate program office. These projects are not subject to ESAAB review; therefore, environmental review is not as comprehensive as called for by the PPMS. For these projects environmental concerns are addressed in the Environmental Coordination Committee's subcommittee meetings.

For all RD&D projects, both major systems and others, environmental research is planned and assessed in a series of documents.

1. **Planning Documents**—To identify environmental concerns and plan research to address those concerns, Environmental Development Plans (EDPs) have been integrated into the PPMS. EDPs identify and integrate required environmental, safety, and health research at each phase of technology projects so that this information will be available to decision-makers when resource commitments for further development are made. Preparation of EDPs for each technology is the responsibility of the Environmental Coordination Committee. This committee functions through subcommittees designated for each technology. Subcommittees include representatives from both the Office of Environment and the appropriate program office. Much of the research identified in EDPs is conducted at particular project sites. The subcommittees prepare Project Environmental Plans, which detail the site-specific environmental research to be conducted for all projects.

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*For example, development cost criteria stipulate that a project is considered "major" if there is an estimated $50 million annual or $200 million lifetime cost.

2. **Review and Assessment Documents**—Three documents—Environmental Readiness Documents (ERDs), Environmental Assessments (EAs), and Environmental Impact Statements (EISs)—are used to assess the environmental acceptability of an energy system acquisition project.

   Environmental Readiness Documents serve several purposes. As assessments prepared independently by the Office of Environment, they are used by the Assistant Secretary for Environment to advise the Energy System Acquisition Advisory Board or program manager about whether it is suitable for an energy technology to move to the next phase of development. ERDs present the results of environmental research already carried out, and provide further definition of concerns and research needs for subsequent phases of development. As analytical reference documents, ERDs are also designed to be useful in "scoping" environmental concerns and supporting Environmental Impact Statement preparation.

   The National Environmental Policy Act of 1969 (NEPA) requires Federal agencies to prepare Environmental Impact Statements (EISs) for major actions that significantly affect the quality of the environment. An Environmental Assessment (EA) is a preliminary analysis to determine whether the impact of an action will be significant, and is used to decide if preparation of an EIS is necessary. EISs provide at present the major opportunity for public input into the DOE decision-making process through required review and comment. Recently revised guidelines for the NEPA process (effective July 30, 1979) include several other means for public involvement. For example, "scoping" meetings must be held early in the process to help determine the issues and concerns to be addressed in the preparation of an EIS.

   A further description of NEPA and internal DOE environmental documents is given in Figure 2.

**Strengths of the Process**

The PPMS and the environmental planning and assessment process are intended to ensure environmentally responsible decision-making. As designed, the total process exhibits many aspects of an effective management system, and represents progress toward sound, environmentally responsible decision-making. The process has the following specific strengths:

1. **It provides a systematic means of managing technology development**—It does this by identifying the distinct phases through which every technology must pass, from initial research to full-scale commercialization. It explicitly considers environmental concerns at points where decisions on further development must be made.

2. **It provides an opportunity for the Office of Environment to play a major role in DOE decisions**—through membership on the Energy Systems Acquisition Advisory Board (ESAAB), chairmanship of the various Environmental Coordination Committees (ECC) subcommittees, and review and approval of Environmental Assessments (EAs) and Environmental Impact Statements (EISs).

3. **It has been successful in correctly identifying categories of environmental issues**—Classical environmental concerns (e.g., air and water pollution) are clearly defined, and other types of concerns (e.g., socioeconomic impacts) have at least been identified.

4. **It attempts to systematically integrate technology development and environmental research**—This integration is achieved through several means:

   - Linking of technology planning and environmental research planning through timetables and review procedures.

   - Representation of both the program offices and the Office of Environment on the ESAAB and ECC subcommittees. These subcommittees also foster day-to-day contact between both groups at the working level.

   - Joint preparation and approval of Environmental Development Plans (EDPs) and Project Environmental Plan (PEPs) by the Office of Environment and program offices. The documents lay out environmental concerns and identify the research needed to address those concerns on a technology-wide and site-specific basis. These research needs are then integrated and implemented through the budgetary process.

   - Preparation of Environmental Readiness Documents (ERDs), which provide formal environmental inputs to technology decision-makers.

5. **It has substantial documentation requirements**— Environmental planning and assessment documents ensure that all decision-makers have the same data on which they can base decisions. These documents also afford an *opportunity* for outside groups to audit internal planning and decision-making.

| DOCUMENT | PURPOSE | CONTENTS | PREPARER | PUBLIC ACCESS | TIMING |
|---|---|---|---|---|---|
| 1. Environmental Development Plan (EDP) | Define major environmental concerns associated with a particular energy technology and general environmental research requirements for addressing those concerns. | • Define environmental concerns.<br>• Assess status and risk.<br>• Identify R&D needs.<br>• Describe R&D plan. | Office of Environment in conjunction with ECC subcommittee for that technology. | Internal document, available by request. | Annual revision of EDPs is formally called for, however, major updates of EDPs will likely coincide with PPMS phases in the future. |
| 2. Energy System Acquisition Project Environmental Plan (PEP) | Plan environmental R&D for a specific project. | • List research projects (including NEPA requirements).<br>• Identify the sponsoring office.<br>• Specify funding requirements.<br>• Provide a research completion schedule. | Office of Environment in conjunction with ECC subcommittee for that technology. | Internal document, available by request. | In conjunction with site-specific technology research plan. |
| 3. Environmental Readiness Documents (ERD) | Review environmental status of a particular technology and serves as formal Office of Environment input to DOE technology development decisions. | • Assess environmental readiness of a technology to move on to the next development stage.<br>• Discuss current and potential regulations affecting technology and control technology options.<br>• Assess delays and costs associated with adverse environmental findings. | Office of Environment in conjunction with ECC subcommittee for that technology. | Internal document, available by request. | Prior to PPMS decision gates. |
| 4. Environmental Assessments (EA) and Environmental Impact Statements (EIS) | EAs evaluate if EISs should be prepared in order to meet NEPA requirements. EISs assess environmental impacts of proposed major Federal actions. | • Describe proposed actions.<br>• Describe probable impacts.<br>• Describe unavoidable adverse impacts.<br>• Describe possible alternatives. | Technology program manager. | Public review required by NEPA. | Contained in the EDPs and PEPs. |

FIGURE 2. OVERVIEW OF MAJOR DOE ENVIRONMENTAL PLANNING AND REVIEW DOCUMENTS

## III. REGIONAL WORKSHOP SUMMARIES

Four regional workshops were held in July 1979 in Atlanta, Denver, San Francisco, and Pittsburgh. In these workshops representatives from Federal, State and local agencies, environmental and public interest groups, labor, industry, and the general public discussed DOE's Management System and the adequacy of attention this system gives to environmental protection and energy conservation.

Workshop participants expressed some skepticism that the management process actually operates as designed, and stressed a need for it to be more open. They felt that a range of non-DOE entities, including industry, state and local governments, and the public should have more opportunities for meaningful involvement. There was also general agreement that environmental concerns should be viewed from a broad perspective, and should include human as well as natural factors. Most participants felt that environmental concerns resulting from the development of specific technologies had been successfully *identified* in most cases. However, many felt that significant concerns had *not been dealt with* adequately.

In addition to these overall themes, five specific areas of concern emerged about the adequacy of DOE's attention to environmental factors in its decision-making. Each of these is discussed briefly below, and is treated further in Chapter IV:

1. A concern expressed in each workshop was that *state and local level agencies and organizations were not given a clear role in the DOE decision-making process.* Participants felt that more responsibility should be delegated to these levels, and that this would increase the likelihood that local concerns, as well as generic technology concerns would be dealt with at appropriate times. However, there were some questions that the participants could not resolve: In what environmental issues should State and local agencies be involved? How should the appropriate level of responsibility be determined? How should this approach be implemented?

2. A concern expressed by some participants was that *DOE's formal decision-making process appeared to overemphasize large, high-cost, high-technology programs.* These participants felt strongly that DOE tended to ignore lower cost, decentralized technology systems in their RD&D program. Thus, potentially cost-effective approaches could be overlooked. Another potential risk resulting from limiting top management attention to large projects was that smaller projects could involve serious environmental impacts. Participants felt that a crucial question to be answered is: How can adequate attention to environmental concerns be assured for all technology development programs, regardless of size?

3. One specific suggestion was made by workshop participants to ensure that environmental considerations are incorporated systematically into DOE's decision-making process. They felt that *a set of explicit environmental criteria should be developed and applied to all major decisions in the technology development process.* Further, they felt that these criteria should be explained to the public, and the results of their application to each decision should be disclosed. Development and adoption of such criteria would require resolution of several issues, such as: What specific environmental criteria should be included? How can these criteria be measured and weighted? When and how should the

criteria be applied in the process? Workshop participants began discussion of these questions, but further review is clearly needed.

4. The role of non-DOE groups and individuals in the decision-making process was a major area of concern. *Participants felt that opportunities for meaningful involvement of the public was totally inadequate.* Their concerns focused on three issues: (1) the public does not receive enough information, and what they do receive is very difficult to understand; (2) the public does not have a formal role in reviewing internal documents and decisions, and opportunities for participation afforded by the NEPA process occur too late; and (3) local officials are not consulted adequately about projects planned in their areas and are not systematically involved in decision-making after sites are selected. Workshop participants made a number of recommendations for alleviating these problems which are discussed in Chapter IV.

5. A final area of concern was *how to coordinate technology development and environmental assessment to ensure that adequate attention is paid to environmental issues.* Some participants felt that successful resolution of environmental questions often lagged behind technology development. They felt that in decisions about whether or not to move a technology forward in its development, too much emphasis was placed on technical feasibility, and too little attention was given to understanding the environmental implications and availability of environmental controls. Thus, they felt that while potential environmental impacts were generally identified, they were not always dealt with at the appropriate time. Participants suggested several approaches to improving the integration of technology development and environmental research, including better use of local expertise and a more effective role for the DOE Office of Environment.

## IV. ASPECTS OF DOE'S DECISION-MAKING PROCESS FOR DISCUSSION

Review of the DOE management process has raised issues in five major areas:

- The appropriate governmental level for treating environmental concerns.
- The types of projects receiving major management attention.
- The criteria used in evaluating individual technologies.
- The role of non-DOE interests in evaluating environmental issues.
- The integration of environmental factors into technology decision-making.

In discussing these five issues and preparing their testimony, we would like witnesses to consider how their views would affect the adequacy of attention given to environmental concerns, and how their recommendations might be implemented (i.e., what structures, procedures, or policies should be established).

The intent of this pre-hearing document is *not* to recommend a particular course of action for resolving these five issues, but rather to synthesize comments, questions, and recommendations from the regional workshops and EPA's own analysis of the DOE management process and thereby provide suggestions for further thought and discussion at the October National Hearings. The substance of these discussions will be incorporated into the final Section 11 Report to Congress, scheduled for submission in January 1980.

### Appropriate Governmental Levels for Treating Environmental Issues

The development of an energy technology from its early research stage through its commercialization stage usually requires that associated environmental concerns be addressed at three levels:

- **Local site-specific** concerns—These would be associated with the proposed construction of an emerging technology pilot, demonstration, or commercialization facility. These concerns would typically include site-specific pollution impacts, resource requirements (e.g., water or land) and socio-economic impacts (e.g., "boom town" problems).

- **Regional or cumulative** impacts—The potential environmental problems may be the result of the proposed construction of several similar facilities or of several energy producing facilities of differing types. Typical concerns would include competing resource requirements such as interstate water use agreements, or cumulative pollutant levels.

- **National** concerns—These will need to be addressed no matter where specific energy facilities are located. The overall national concern will be the development of a generic energy technology which is technically, economically, and environmentally viable. Associated environmental problems requiring national level attention are those related to basic health effects and pollutant characterization, and the development of appropriate environmental control technologies.

For the environmental concerns associated with a technology to be addressed adequately, these concerns should be treated at all three levels in a timely manner. At present, the DOE management process does not make explicit who has both the responsibility and the authority for carrying out analyses at the local or regional levels. Thus, the question is how

to design and implement a hierarchical arrangement where responsibility is given to the appropriate level. Certain concerns, such as site selection, will be local—especially important to individuals directly affected by a specific facility. Other concerns, such as water use or transient populations, may be germane only in particular regions. Still other concerns, such as sulfur emissions, will be national.

Although an environmental issue may cut across levels, its resolution may best be undertaken by the level that is affected. Such an approach to resolving environmental conflicts need not necessarily entail multiplying bureaucratic structures. The approach would also permit a wider range of expertise to be tapped. Such a system would clearly identify environmental responsibilities and establish the authority necessary to deal with them at the appropriate level. Although authority would be decentralized, senior DOE management would still coordinate programs, ensure effective information exchange, and review progress in resolving the environmental concerns of the regional and local levels.

### Types of Projects Receiving Major Management Attention

The fundamental purpose of the PPMS is to review energy projects before any commitment of major resources occurs and to ensure that all major energy technology programs are developed with clear, workable, multiyear objectives. However, only proposed projects designated as "major systems acquisitions" receive the full review and management attention of the PPMS. Although DOE uses many factors to determine whether a proposed project is designated as a major system acquisition, *cost* has been the single most important criterion determining the level of management review a project receives.

DOE energy projects not designated major systems acquisitions are under the management responsibility and direction of the appropriate program office. These projects are not subject to ESAAB review; therefore, environmental review may not be as comprehensive as called for by the PPMS. Instead the environmental documents are prepared and the environmental concerns are addressed in the ECC subcommittee meetings.

The Section 11 review has raised two concerns related to the criteria for designating a proposed project a major system acquisition:

- Workshop participants felt "potential environmental consequences" should be included as a critical factor in leading to such a designation. The argument is that the potential for critical, irreversible environmental impacts is at least as important a factor as cost.

- A question was raised whether small *projects* should be aggregated as *programs* and treated, in effect, as "major" projects. Formal high level review could help improve the evaluation of these technologies. Some workshop participants felt that "soft" technologies and conservation programs are not getting the management attention their favorable energy and environmental attributes deserve.

Since the PPMS requires a large part of DOE's management effort, perhaps it should be used to review a larger fraction of the entire RD&D program. One result of such an expansion would be that this forum could allow comparisons of competing technologies and programs. This, in turn, could allow environmental and conservation concerns to play a more active role in resource allocation decisions.

**Criteria Used in Evaluating Individual Technologies**

Explicit environmental criteria applied at all major decision points in DOE's management process could ensure that environmental concerns are systematically treated. Specification of such criteria would help assure that all important environmental factors are examined before decisions are made, and that decisions regarding environmental issues are more consistent across technologies. Well-defined criteria would also add significantly to the *credibility* of DOE's technology decision-making process.

DOE has to date used at least three specific criteria in evaluating environmental concerns:

- Comparisons of pollutant emissions, energy efficiency and resource required per unit of energy produced;
- Estimation of the dollar cost of meeting present environmental standards per unit of energy produced; and
- Estimation of the probability that adverse environmental impacts will ultimately rule out commercialization of an energy technology.

Each of these quantitative criteria has affected DOE decisions, but none is used routinely or is formally required in the management process.

Many workshop participants felt that more explicit criteria are needed, covering such questions as the following:

- What are the impacts of the energy technology on public and occupational health and safety?
- What resources (e.g., water and land) will be required?
- What are the ecological impacts?
- What are the social and economic impacts?
- How will the proposed investment pay off in terms of increased energy supplies or decreased demand?
- Will this technology lead toward a "decentralized" or "centralized" energy system?

In selecting criteria, DOE should try to develop them in quantitative terms and should prioritize them. However, the question remains whether criteria and measurement techniques can be developed which are scientifically credible, and technically feasible. Specification of *decision* criteria could facilitate cross technology comparisons. It could also improve research *planning,* since DOE would know ahead of time what specific information would be required from environmental research programs.

## The Role of Non-DOE Groups in Evaluating Environmental Issues

Comments from the workshops made very clear the view that the interested public feels it has not been provided enough information about emerging energy technologies, energy alternatives, the DOE energy technology decision-making process, or even when or what technology decisions are going to be made. The feeling is that the potential significance and impact of emerging energy technologies at the national, regional, and local levels makes it imperative that the public be informed and able to express its views in DOE's planning and decision-making process.

DOE seems to be aware of many of the frustrations expressed by the public at the workshops. The Assistant Secretary for Environment has stressed the importance of involving the public in the process of considering the potential environmental consequences of emerging energy technologies. A program within the Office of Environment has been designed which should increase substantially the dissemination of information and the opportunity for public involvement. The major elements of this program are:

- Additional DOE effort at the regional level to increase public awareness and involvement;
- Additional involvement of state and local officials;
- Assistance to outside groups in their preparation of energy-related EISs;
- The sponsoring of special energy-environmental conferences and projects at the local and regional levels; and
- Improvement in the distribution of technical and environmental research information.

To date, however, DOE resource constraints have apparently not allowed this program to proceed rapidly.

In general, comments at the regional workshops about involvement of non-DOE groups centered around three concerns:

1. **The public does not receive enough information**—about emerging energy technologies, research findings related to those technologies, or DOE's decision-making process. The public frequently does not know that decisions are being made, the nature of the decisions, and what options are available. Suggestions for improving information dissemination included:
    - Making internal DOE documents available to the the public;
    - Preparing and distributing summaries of information contained in these documents. These summaries should "translate" bureaucratic and technical materials so that the public can understand them;
    - Publishing records of ESAAB deliberations and recommendations; and
    - Establishing a central information source through which the public can get answers to questions.

2. **The public does not have a formal role in reviewing internal documents and decisions**—The opportunities that do exist through the NEPA process often occur too late in the DOE decision-making process after many important decisions have already been made. There have been many suggestions which would result in earlier systematic public involvement in the process, including:

   - Establishing a formal review and comment system for some or all internal documents related to environmental research;

   - Providing public representation on the ESAAB or establishing a parallel public review committee; and

   - Establishing advisory groups for specific technologies.

3. **DOE often does not sufficiently involve state and local officials and organizations**—in planning and reviewing projects that directly affect their jurisdictions. Involvement should begin as soon as initial siting decisions are made and should include an active role in research planning and technology decision-making, not simply the opportunity to react to documents. Some suggestions for involving state and local entities at appropriate points in the process are discussed under Section A. Others include:

   - Establishing state or local boards or commissions with specific responsibilities and authority; and

   - Making greater use of local expertise in planning and interprmting research studies.

**The Integration of Environmental Factors into Technology Decision-Making**

In addition to establishing the technological feasibility of new energy technologies, DOE must also consider environmental impacts resulting from the use of those technologies. Comments from the workshops addressed several aspects of the integration of technology and environment.

The first dealt with the role of the Office of Environment in technology development. Several questions raised at the workshops noted that the PPMS was project-oriented and that the Office of Environment's role is largely limited to one of influencing *project* development, rather than effecting *policy* development. Further, because there are at present no explicit, consistent environmental criteria for decision-making, the Office of Environment's role in influencing cross-technology decisions appears limited and uneven.

Presently the Office of Environment influences the DOE technology decision-making process through representation on the ESAAB, ECC subcommittee chairmanships, and review and approval responsibilities of Environmental Impact Statements in conjunction with the DOE General Counsel. However, it may be possible for the Office of Environment to play more of an *advocacy* role, and to promote the development of those energy technologies that are particularly positive from a conservation and environmental standpoint. For this to happen the ESAAB should review a larger portion of DOE's RD&D programs, both major systems and smaller projects, using explicit criteria for cross-technology comparisons.

The second aspect of the integration question revolves around DOE's objectives in building and operating pilot and demonstration plants. DOE's mission is to develop and commercialize technologies that are economically practical, technically feasible, and environmentally acceptable. One approach is for DOE to demonstrate at a smaller scale that it is feasible for a technology to operate before commercial development. Another approach is for DOE to build "experimental" facilities for use as laboratories for refining the technology, characterizing the health and environmental impacts and developing environmental control technologies. The distinction between these approaches is important, because decisions made at the plant design stage will differ according to the interpretation of the DOE objective. An integrated technology and environmental research orientation would lead to the design of experimental facilities, rather than demonstration of the viability of a single plant.

The last aspect of the integration of technology and environmental issues is the concern voiced at the workshops about the extent to which EAs and EISs are a part of the PPMS review, and whether they *can or do have any real impact* on DOE technology decision-making. To date, there does not appear to have been a great deal of impact, nor have the EAs and EISs built upon the internal environmental planning and assessment documents.

# APPENDICES

## Background

The regional workshops—held in Atlanta, Denver, San Francisco and Pittsburgh, during July 1979—were intended to give EPA initial feedback on participants' perceptions of DOE's decision-making process, and to encourage participants to begin preparing testimony for the October National Hearings. Specifically, the goals of the workshops were to:

- Present an overview of the research, development, and demonstration (RD&D) process.
- Obtain from participants their opinions about the adequacy of attention this process gives to environmental issues, and opportunities for public participation in the process.
- Present a report on the decision-making process as applied to one or two specific technologies.
- Discuss with participants their views of the future development of these technologies and their recommendations for public participation in the process.

To accomplish these goals, a one-day workshop was designed which included both presentations of information and opportunities for discussion. The morning session focused on the formal DOE nonnuclear RD&D process for major systems acquisitions (especially the Program and Project Management System), and the afternoon session was devoted to discussion of the DOE process as applied to specific technologies. Materials describing the process and its application to the specific technologies were mailed to participants prior to the workshop.

Each session began with a brief presentation of highlights of these materials. Participants were then divided into small, heterogeneous work groups which were given a list of questions to guide, but not limit, their discussion. The morning session focused on the following issues:

- What specific environmental factors should be considered prior to DOE decisions?
- Is the DOE process sufficient for addressing the environmental problems of individual energy technologies?
- What role should the public play in the process?

In the afternoon, work groups considered the following questions for the technologies under consideration:

- What are the environmental concerns about the impact of the development of the technologies? Have DOE processes successfully identified and dealt with these concerns?
- Has DOE disseminated information about the technologies widely enough? What has been the involvement of the public and state and local governments in the development of this technology?

The groups were not expected to reach a consensus, although there was a surprising agreement on many questions.

Each work group chose a spokesperson to present its comments to the entire workshop. The participants and EPA staff then had an opportunity to discuss the questions, concerns, and recommendations developed by the work groups.

The workshop concluded with a brief discussion of the October National Hearings and an open discussion of other issues or unanswered questions.

Approximately 200 people attended the four workshops. They represented a wide range of organizations and interests, including industry labor, environmental, and public interest groups, universities and research organizations, and state and local governments.

## APPENDIX A. ATLANTA WORKSHOP SUMMARY

The first regional Section 11 workshop was held in Atlanta, Georgia, on July 12, 1979, at the Peachtree Plaza Hotel. This workshop focused on the DOE nonnuclear RD&D planning and assessment process and on two specific technologies, urban waste utilization and cogeneration.

Invitations to participate in the workshop were sent to 250 individuals representing a wide variety of organizations, interests, and areas of expertise. Fifty-five active participants and several Government and other observers attended the workshop. The group was composed of representatives of industry (29%), environmental groups (21%), state and local governments (16%), Public Interest Groups (11%), offices of U.S. Representatives and Senators (9%), universities (7%), and other groups (7%).

### The DOE Environmental Planning and Assessment Process

During the morning session, participants discussed the formal DOE planning and assessment process for major system acquisitions (the Program and Project Management System).* Specifically, work groups discussed the adequacy of attention given to environmental concerns by this process and the opportunities for public participation in it. Following a brief overview of the process, participants broke into work groups to discuss these issues. The groups' comments and recommendations were then presented to the entire workshop. Several major concerns and suggestions regarding the process emerged. Although these comments do not necessarily represent a consensus of all participants, they were repeated by several groups.

Skepticism was expressed about the extent to which the actual decision-making process follows the formal design. Some participants felt that if the system does in fact adhere closely to its design, it was unnecessarily complex and costly, and that its extensive documentation did not necessarily increase the likelihood that environmental concerns would be considered at appropriate points. In particular, separation of technology development and environmental research into two "tracks" covered by separate plans (Technology Program Plan) and managed by separate offices (Program Office and Office of the Environment) was viewed as having both positive and negative aspects from the environmental perspective. On the positive side, participation by the Office of Environment should ensure that environmental concerns will not get lost or ignored in the interest of development. In fact, some participants felt that Office of Environment responsibility should be expanded to include not only review but also preparation of NEPA documentation (Environmental Assessments and Environmental Impact Statements) which is now performed by the Program Office. On the other hand, separation of responsibility into two Offices could lead to extra cost, poor coordination of environmental and technology research efforts, and, ultimately, a lack of attention to environmental issues in planning and at key decision points. Methods for achieving coordination between environmental and technology research and for achieving a balance between the positive and negative factors cited above were not suggested.

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*This system was described in the *Section 11, Environmental Evaluation* Document used as a reference document for all workshops.

Participants questioned whether the Energy Systems Acquisition Advisory Board* had specific criteria governing its deliberations, review of documents, and recommendations about the readiness of technology to move forward to a further phase of development. There was a general agreement that such criteria should exist, particularly for evaluation of the Environmental Readiness Document, and should be made public. Among the environmental criteria suggested were traditional environmental concerns (effects on water, air, land, wildlife, vegetation) and the broader economic, human, and social effects of a technology.

Timing of environmental research was viewed as important by several work groups. They felt that relevant environmental research should be performed as early as is feasible in the process, before major capital investments have been made in a technology. Several participants questioned whether there is a point beyond which it is virtually impossible to halt the development of a technology, regardless of the findings of environmental research.

Finally, several participants expressed the view that this process reflects DOE's overemphasis on large high-cost, high-technology projects. These participants felt strongly that DOE tended to overlook lower-cost, decentralized, appropriate technology systems in their RD&D programs. Thus, potentially cost-effective technological approaches might be lost sight of early in their developmental process. In particular, several participants expressed dissatisfaction that solar technologies had not been emphasized more by DOE and in these workshops.

**Public Participation in the Process**

Work group reports indicated general consensus that public involvement in the Program and Project Management System was inadequate. Representatives of environmental groups, public interest groups, and industry stated that they did not have adequate information or channels of access for systematic involvement. Many participants felt that the public should be brought into the process earlier — by the time the public has an opportunity to participate, primarily through review of Environmental Assessments and Environmental Impact Statements, it is too late for their opinions to affect many important decisions.

Two factors were presented as crucial for achieving effective public participation in the process: better dissemination of information and some level of funding support. In citing the need for more information, participants said that the public frequently does not know that decisions are being made, the nature of the decisions, and the options available. Two reasons for this were suggested: first, most relevant documents are not made available for public review, and second, materials made available do not clearly outline the nature and effect of decisions to be made. There is need for "translation" of documents, decisions, and procedures so that interested members of the public can understand them. Summaries of materials, with a minimum of bureaucratic and technical jargon, would be helpful in this process. One work group also suggested that the media should be encouraged to sponsor forums to promote discussion of issues and dissemination of information. Another group

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*The Energy Systems Acquisition Advisory Board is an internal group which recommends to the Under Secretary whether or not a technology should be advanced to a further phase of development.

felt that required environmental education in the schools would give more people the basic knowledge needed to develop informed opinions. A third group praised the efforts of DOE's Office of Consumer Affairs in responding to requests for information.

The second requirement for sustained public participation cited by several work groups was funding to support such efforts. It was agreed that this funding should not be confined to any one group or interest, but a method for apportioning money among interested groups and individuals was not presented.

Several specific mechanisms for involving the public in the process were suggested. First, several work groups recommended public involvement with the Energy Systems Acquisition Advisory Board. Some suggested that the public should be represented on the Board; others felt that an outside public review board should be established. This public review board should actually meet and discuss issues, not just review written materials and submit written comments. No method for electing public representatives for the ESAAB or an outside board was suggested.

It was generally agreed that the EPA Section 11 regional workshops are a good idea and should be continued. Some participants felt that local workshops would be helpful as well, although they recognized that the cost would be prohibitive.

Many participants noted that one effect of public participation was to slow down the process. This could be a distinct drawback, since many beneficial projects could be delayed. On the other hand, early public involvement could enable DOE to anticipate and deal with issues as research progresses, thus avoiding lengthy delays later on.

Finally, the groups discussed who should be included in public participation activities. The major question they considered was whether the general public should be involved, or whether systematic involvement should focus on the "informed" public. Although broad participation was felt by many to be ideal, several groups concluded that major effects to involve the general public might be too costly and the return too small. While no one should be excluded from public meetings, it was most important to involve the "informed" public.

**Environmental Concerns in Urban Waste Utilization and Cogeneration Technologies**

The workshop in Atlanta focused on these two technologies for several reasons. These technologies have the potential to contribute significantly to energy conservation programs in the United States and were 2 of 16 commercialization technologies selected by the DOE Commercialization Task Force for development and promotion. Further, a number of privately developed and DOE-supported facilities are operating in this region.

During the afternoon session of the workshop, participants were grouped by area of interest — urban waste utilization, cogeneration, or both. The groups discussed their perceptions of the historical development of the technologies; their concerns about environmental, political, technical, and social factors affecting future development; and their recommendations regarding the appropriate role of the public in the development of the technology. Some of the work groups' comments related to particular projects or technical problems. A number of more general observations are reported below. Although these comments and recommendations do not represent a consensus of the total group, they were repeated by several work groups.

A major theme in the discussion of these technologies was a need for DOE to adopt a less rigid stance, and to allow for more diversity. Many participants felt that the present system is focused only on a few high-cost, high-technology programs, and that smaller-scale, appropriate technology projects were not adequately encouraged. Participants cited the lack of any reference to recycling programs in the issue paper prepared for the workshop on urban waste utilization* as an example of this approach. In the same vein, some participants felt that DOE should put more effort into promoting conservation in addition to supporting energy production.

In the area of urban waste utilization, one group felt that DOE should concentrate on recycling and bioconversion rather than combustion technologies. Combustion was viewed as a short-term solution only; it was felt that the other two offer more long-term benefits. Most of the groups mentioned recycling as an important program. Participants emphasized that successful recycling efforts could not depend on volunteers. In almost all volunteer projects, initial interest and enthusiasm eventually wanes, and the project fails. Funding must be made available for continued operation, or recycling should become a regular municipal function.

Participants felt that if urban waste utilization technologies are to be developed, source separation should be encouraged. Most felt that people would be willing to cooperate with these efforts.

Many participants felt that in assessing these and other technologies, DOE should examine carefully the total impact of the technology, including its by-products and associated expenses. This comprehensive and systematic analysis should encompass primary and secondary effects on the traditional environmental areas (water, air, land, vegetation, wildlife) and an assessment of human and social effects, total costs and benefits, and net energy loss or gain. Participants felt that DOE should be assisted in this analysis by local community groups, public interest groups, environmental groups and industry. Some felt regional citizens' advisory committees should be established and meet regularly to discuss issues affecting their area.

**Public Participation in Urban Waste and Cogeneration RD&D**

Participation was viewed as a two-way process that would benefit both the government and the public. Both the public and DOE have responsibilities for making participation successful. As was the case with the system as a whole, participants felt that the public needed more information on specific technologies in order to participate fully.

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**Issue Paper on Urban Waste and Cogeneration Technologies*, Section 11 Workshop July 18, 1977.

## APPENDIX B. DENVER WORKSHOP SUMMARY

The second regional Section 11 workshop was held in Denver, Colorado on July 18, 1979, at the Environmental Protection Agency Regional Office. This workshop focused on the DOE nonnuclear RD&D planning and assessment process and on DOE's involvement in oil shale research and demonstration.

Invitations to participate in the workshop were sent to individuals representing a broad range of organizations, interests, and areas of expertise: forty-six people attended the workshop, representing universities and research organizations (24%), environmental groups (17%), public interest groups (13%), state and local government (13%), industry (6%), and other groups (26%).

### The DOE Environmental Planning and Assessment Process

During the morning session, discussion focused on the formal DOE planning and assessment process for major system acquisitions (the Program and Project Management System).* Following a brief overview of this system, participants broke into work groups to discuss the adequacy of attention given to environmental concerns by the system and the opportunities for public participation in it. Each group's comments and recommendations were then presented to the entire workshop. No attempt was made to reach consensus on these issues, but this summary reports comments that emerged as major themes or concerns.

Many participants felt that there were a number of shortcomings in the way this system handles environmental research. Most participants felt that "environmental" factors were defined too narrowly and that, in addition to the traditional concern with air, water, wildlife, and vegetation, environmental effects research should include health and safety issues, social and economic effects, and net energy questions. They also felt that cumulative and synergistic effects of several projects in an area should be examined in a regional or community Environmental Impact Statement. They expressed frustration with the existing fragmented approach to environmental research and felt that a more comprehensive view was needed. They were particularly interested in seeing a greater sensitivity to state and local concerns and felt strongly that state and local officials should be included much earlier in the planning process.

Timing was an important issue in this discussion. Many participants felt that environmental factors should be considered earlier in the process, so that major environmental issues would be identified prior to the first major decision. After that, environmental and technology research should go hand in hand. Participants also felt that monitoring and updating of environmental research was crucial, particularly in terms of social and economic impacts.

Finally, participants were concerned about the relative emphasis given to environmental research. Some felt that the process was too "driven" by the Program Office. They felt that

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*This system is described in the *Section 11, Environmental Evaluation* Document used as a reference document for all workshops.

more interaction was needed between environmental and technology research before people take sides and conflicts occur. Some felt that it would be more appropriate for Environmental Assessments and Environmental Impact Statements to be prepared by the Office of Environment rather than by the Program Office.

In a more general discussion of the Program and Project Management System, participants said that a formal system incorporating a uniform accountability was needed for smaller projects as well as major systems. Several groups also suggested that the process should allow for more comparison of technologies as they are being developed including conservation and solar technologies. Several participants recommended better coordination between DOE and EPA to avoid duplication of effort whenever possible. Finally, several groups felt that criteria and data bases used in the decision process should be standardized and made public.

**Public Participation in the Process**

There was general agreement among the work groups that public participation in the process was inadequate. One of the major recommendations formulated by the groups was earlier, more meaningful involvement of state and local governments, industry, and interested organizations. Participants felt that these groups should be included in planning for projects as soon as siting decisions are made and that the role of these groups should include shaping project development and preparing criteria, not just reaction or review. Active involvement in a steering role of those who could be affected by a project would encourage a community's sense of ownership of a project and the building of cooperative working relationships.

In addition to this site-specific recommendation, participants noted that improvements were needed in DOE's information dissemination procedures. They felt that internal environmental documents should be more readily available and that there should be a system for public comment on all documents, not just the NEPA materials. Further, if public participation is to be effective and meaningful, some participants felt that better public education and a central information source are also needed. It is difficult for the public to keep track of the many small decisions made by various agencies and to be aware of when, where, and how to attempt to have an impact.

The work groups agreed that the process should be more open and suggested several means for achieving this. In addition to making documents more available, these included publishing the recommendations of the Energy System Acquisition Advisory Board, holding regional conferences to discuss policy questions, and establishing regular community boards for site-specific questions. Participants stressed that effective public participation requires a sustained effort and some funding support. One group suggested that a set proportion of each project's budget be set aside to support public participation activities. Another participant recommended that U.S. Senators and Representatives should sponsor attendance of people from their districts or states at meetings such as the October National Hearing.

Finally, participants noted the potentially negative aspects of public participation. They warned against any system that would create more bureaucracy or that would slow the process down too much. No specific suggestions were made about how these pitfalls could be avoided.

**Environmental Concerns in Oil Shale RD&D**

In the afternoon, participants were asked to focus-in specifically on oil shale, and to discuss how the DOE process had worked for this technology. Oil shale was selected as the major technology for discussion at this workshop, because a large percentage of the country's highest quality oil shale resources are located in this region. One major area of uncertainty was the effect that President Carter's energy initiatives would have on oil shale research and development and on the associated environmental research.

Participants reiterated several themes from the morning session. They stressed the need for a holistic view of "environmental" impacts including the human as well as the natural environment. Thus, in addition to traditional concerns, they said that oil shale environmental research should include long-term health effects; impacts on water rights, particularly secondary impacts caused by increases in population due to the projects; and positive and negative social and economic effects resulting from new jobs and increases in population, such as increased cost of living, crime, etc. They also mentioned a need for cost-benefit studies on control technologies to be included under environmental research.

The participants said that they did not have enough information to judge whether DOE's environmental research process had identified all these concerns and dealt with them. Several believed that the concerns had probably been identified but that solutions had not been developed for all of them, particularly the social and economic problems. Some felt that this research should be subjected to a greater degree of outside peer review.

Finally, participants repeated their recommendation that environmental concerns be addressed earlier in the process and that technology research and environmental research be more closely coordinated.

**Public Participation in the Oil Shale RD&D Process**

There was almost unanimous agreement among participants that the DOE's information dissemination procedures were inadequate. Several participants reported that they had not been able to obtain documents through regular channels. One participant said that in order to obtain a specific Environmental Readiness Document, it had to be "leaked" to him.

Another widespread complaint was that materials were virtually incomprehensible. They requested that summaries of environmental documents be prepared and that these summaries contain a minimum of technical and bureaucratic jargon.

As in the morning session, participants stressed the importance of involving appropriate state and local officials and organizations in the planning phases of oil shale projects. They felt that it was particularly important that this kind of involvement be incorporated into any new groups and processes developed in response to President Carter's recent energy

message. Participants were concerned that the President's emphasis on oil shale development could have highly detrimental effects if environmental issues were not examined comprehensively and with sensitivity to local concerns.

## APPENDIX C. SAN FRANCISCO WORKSHOP SUMMARY

The third regional Section 11 workshop was held in San Francisco, California, on July 24, 1979 at the Environmental Protection Agency Regional Office. This workshop focused on the DOE non-nuclear RD&D planning and assessment process and on research and development of geothermal technologies.

Invitations to participate in the workshop were sent out by the EPA Regional Office to individuals and organizations that had been actively involved in discussion of geothermal projects. Thirty-seven participants attended the workshop, representing state and local government agencies (35%), relevant Federal agencies such as the Bureau of Land Management and U.S. Geological Survey (16%), research laboratories and universities (13.5%), industry (13.5%), environmental groups (8%), and other organizations and areas of expertise (13.5%).

### The DOE Environmental Planning and Assessment Process

The morning session of the workshop focused on the formal DOE planning and assessment process for major systems acquisition (the Program and Project Management System).* Following a brief overview of the process, participants broke into work groups to discuss the adequacy of attention given to environmental concerns by this process and the opportunities for public participation in it. The groups' comments and recommendations were then presented to the entire workshop for discussion. Although the groups were not always able to reach a consensus, and no attempt was made to generate consensus among groups, several issues emerged as major themes. These concerns were voiced by several groups and received support from a number of workshop participants.

The initial reaction of most participants to the Program and Project Management System was that it is irrelevant to their experience, since it applies only to projects that receive very substantial DOE support. Their experience with geothermal development and other DOE projects had not brought them in contact with the system. Many felt that this emphasis on large projects was too limited and that criteria other than funding levels should be used in assigning technologies to the process. These criteria could include breadth of applicability, nationwide potential, and value to a specific site or location. These criteria should also be applied to initial decisions about projects and in setting priorities. Many participants felt that the system reflected a DOE philosophy that is too hardware-oriented, and that more attention should be given to smaller scale technologies and projects.

In their discussion of how this process deals with environmental concerns, the work groups had two general recommendations: "environmental impacts" should be defined broadly and assessment should occur very early in the process. Participants suggested that there should be an initial assessment for each geographical area in which a project is being considered to establish baseline data and to determine what environmental factors might be affected. Several participants stressed the importance of gathering baseline data before a project is initiated, then regularly monitoring project effects against this information.

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*This system was described in the *Section 11, Environmental Evaluation* Document used as a reference document for all workshops.

There was general agreement that a broad range of potential impacts should be considered, including traditional elements, social and economic costs and benefits, land use compatibility, qualitative changes in the resource brought about by development or occurring naturally, conservation of the resource, aesthetics, specific needs and concerns of the local community, and cumulative effects of more than one project in an area or one project over time. These environmental issues can be broken down into those generic to the technology and those which are site-specific.

Participants felt that the process described in the Program and Project Management System might be adequate for making generic technology decisions, but that it needed major additions to be appropriate for making site-specific decisions. These additions would focus on early involvement of local officials and community groups in planning and research so that local concerns could be brought into the decision-making process as soon as siting decisions are made, and local expertise could be tapped in conducting research. In this way, a balance between national goals and local effects could be achieved. It would also enable DOE to put its efforts into areas that are of major concern to those affected by a project. One participant summed up this discussion by saying that "DOE answers questions no one asks and then does not have information on issues of considerable local concern."

Many participants criticized the timing of environmental research. They felt that research to develop the technology proceeds ahead of environmental research. They felt that these two areas should be more closely coordinated and that DOE should be supporting more research and demonstration of control technologies.

**Public Participation in the Process**

As indicated above, there was general agreement that public participation in the process needed improvement. Several specific suggestions were made by the work groups, most of which focused on better dissemination of information.

Most of the groups agreed that better information dissemination was needed and documents should be made more readily available for public review. A number of participants had attempted to obtain internal DOE environmental documents in the past without success. Public review would require that the public be informed of the existence of the documents, the nature of the documents, and how to obtain them and submit comments. One group recommended that DOE establish a Public Advisors Office which would have responsibility for disseminating information and answering questions. This office should undertake an aggressive outreach effort to a wide audience, including industry, state and local governments, environmentalists, and technical experts. The group suggested that this program be based in the regional offices and be coordinated with state and local energy and environmental boards or commissions. Crucial to the success of such a program in several groups' opinion, was access to a real person who could answer questions. It was suggested that a toll-free telephone number would be helpful.

Other mechanisms were suggested to improve the public's ability to use available information. These included a system to make people aware of past and present research projects, and a newsletter or computer access system containing updated information on the status of projects. Other participants said that an understandable document summarizing technologies and projects would be very useful. These suggestions grew out of a need

expressed by several participants for DOE not merely to release the current internal documents to the public, but also to make an effort to assist readers in understanding these materials.

**Environmental Concerns in Geothermal RD&D**

The workshop in San Francisco focused its afternoon technology discussion on geothermal energy because California's hydrothermal resources account for over 70% of the electrical energy potentially recoverable from such reservoirs in the U.S. The largest geothermal power plant in the world is located at The Geysers in California, and electricity will soon be produced commercially from liquid-dominated reservoirs in Southern California's Imperial Valley. Many of the workshop participants had been actively involved in The Geysers project, through industry, local government, or citizens' action groups. They had discussed many of the environmental issues surrounding geothermal development in the past, and many conflicts had, over time, been resolved. One participant from industry and one community representative presented a brief overview of their experience with this project and perspectives on it.

The major conclusions from the work groups were that environmental research should begin earlier in such projects, that more baseline data are needed before development begins, and that a whole-system, coordinated approach to environmental research is needed. They questioned how much environmental research should actually be conducted before a demonstration begins. Finally, they said that there was a need for both generic planning and study, and site-specific planning and study.

**Public Participation in Geothermal RD&D**

The experience of the participants with geothermal projects led them to conclude that—although DOE has not been totally unresponsive, and in some instances, DOE staff have been very helpful—there was a lack of *systematic* public involvement and information dissemination. This major problem is exacerbated by the fact that summaries of information do not exist.

A major issue raised by many participants was that DOE does not ask local officials and the community what they want. There is no systematic method for involving local officials and citizens after siting decisions are made. They felt that there should be much more careful coordination of Federal, regional, state and local activities and clarification of the roles and responsibilities of each level. During this discussion participants wrestled with difficult questions concerning the appropriate role and scope of responsibility for DOE. They recognized contradictions in some of their recommendations—asking DOE to take more responsibility for follow-up on environmental research and long-term monitoring while also asking for greater local autonomy and decentralization of responsibility.

DOE's role as an R&D agency was discussed in relation to other needs such as long-range planning and long term support of environmental research. Questions were raised about DOE's responsibility for environmental study in the case of private development, as opposed to publicly-supported projects; and about the extent of DOE's responsibility for site specific studies in addition to generic research on a technology's environmental effects. These issues were not resolved, but the questions provoked considerable discussion.

## APPENDIX D. PITTSBURGH WORKSHOP SUMMARY

The fourth regional Section 11 workshop was held in Pittsburgh, Pa., on July 31, 1979, at the Pittsburgh Hilton Hotel. This final workshop focused on the DOE non-nuclear RD&D planning and assessment process and on two specific technologies—coal liquefaction and coal gasification.

Invitations to participate in the workshop were sent to 125 individuals representing a wide variety of organizations, interests, and areas of expertise. Forty-five people attended the workshop, from industry (24%), environmental groups (18%), public interest groups (16%), state and local government (11%), universities and research organizations (11%), and labor (4%). Also participating in the workshop were several private citizens who have been actively involved in the local debates over the Morgantown, West Virginia, project, and a class of students from California State College in California, Pennsylvania.

### The DOE Environmental Planning and Assessment Process

During the morning session, participants discussed the formal DOE planning and assessment process for major system acquisitions (the Program and Project Management System).* Following a brief presentation of an overview of this system, participants broke into work groups to discuss the adequacy of attention given to environmental concerns by this process and the opportunities for public participation in the process. The work groups then presented their comments and recommendations to the entire workshop for discussion. No attempt was made to develop consensus around these comments; therefore, this summary reports those concerns that were repeated by several participants and emerged as major themes of the workshop.

An initial question many participants asked was whether this process actually worked as it was designed. They suggested that it should be audited to see if in fact the process is having an impact on decisions or if the information contained in the various documents is actually ignored. They also wondered if the process was now irrelevant because of President Carter's proposed energy initiatives for "fast tracking" synthetic fuels.

Another major issue raised by the work groups was how decisions about overall energy planning and management are made. Where in the process are technologies compared and environmental trade-offs resolved, and how are priorities set among renewable and nonrenewable technologies? They also questioned how energy conservation fits in and whether it is a factor in this process. Some participants expressed concern that, in their view, DOE's philosophy tends toward the view that "the only solutions to energy problems are technological."

Another overall criticism expressed by some participants was that the process deals only with very large projects. They raised the possibility that some smaller projects could have serious environmental effects, and although similar documentation is produced for smaller

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*This system was described in the *Section 11, Environmental Evaluation* Document which was used as a reference document for all workshops.

projects, they were concerned that the Office of Environment does not have the same formal input.

Several work groups said they felt that specific criteria were needed for Energy Systems Acquisition Advisory Board* recommendations and for the decisions made by the Under Secretary on whether to move a technology to a further phase of development. They suggested that environmental factors be used to form a "threshold," or minimum standard particularly in decisions on whether to pursue a technology at all. If a project or technology did not reach the environmental threshold, conditions should be placed on approval to move it to the next phase. These conditions would require that environmental issues be resolved before development was continued. Participants also felt that efficiency should form a similar threshold, and that there should be serious consideration of how society would get the greatest benefit from dollars spent, both short- and long-term.

In discussing specific environmental factors that should be considered in the process, participants listed those associated with construction (noise, water, air, and social and economic effects) and with operation (air, wastewater quality and quantity, equipment and signal noise, climatic effects, social and economic costs, and effects on property values). They agreed that the conventional technical environmental factors have generally been identified but not necessarily dealt with and resolved. They felt, however, that it was crucial to look beyond these elements and consider the site-specific effects of any project. A number of participants felt tha. these site-specific issues were not receiving adequate attention or satisfactory resolution. Several groups felt that Environmental Impact Statement preparation should be the responsibility of the Office of Environment instead of the Program Office.

A final area that needs improvement, according to many participants, is coordination and communication among various layers of Government.

**Public Participation in the Process**

One work group summed up the feelings of many participants in the statement that "public input seems to get lost in the maze of a vast bureaucracy." It seems to go into a black box, and there is no accountability to the public.

There was general agreement that better dissemination of information was of critical importance to effective public participation. Participants said that active outreach was needed and made several specific suggestions to improve public access to information. These include summaries of reports that use less jargon and interpret what the data mean to the public; putting copies of relevant documents in libraries; distribution of minutes or synopses of meetings to interested parties; compilation of extensive mailing lists from public meetings and inquiries for dissemination purposes; and establishing a toll-free telephone number to a person who can answer questions.

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*The Energy System Acquisition Advisory Board is an internal group which recommends to the Under Secretary whether or not a technology should be advanced to a further phase of development.

Participants felt that the timing of public input is important and that review of Environmental Impact Statements is too late. They felt that earlier discussion of issues in public forums was needed to encourage communication, rather than presentation of testimony for or against an issue. It was suggested that this discussion be national in scope in the initial planning phases, and that local committees should then be formed for siting decisions and to operate throughout the rest of the process. Some funding support would be needed but the participants did not agree about the level of this support. One work group also recommended evening meetings to facilitate participation by working people.

Several groups requested that the public be given an opportunity to review Environmental Development Plans and Project Environmental Plans, to ensure that all appropriate environmental concerns are included, and to review the Environmental Readiness Document, to ensure that some responses have been developed for each concern. They also felt that the public should be able to review Energy System Acquisition Advisory Board recommendations and the process and rationale for their decisions.

**Environmental Concerns in Coal Liquefaction and Coal Gasification RD&D**

During the afternoon session, the discussion focused on two specific technologies, liquefaction and coal gasification. These two technologies were chosen for discussion by this group because of the potential development of a coal synthetic industry in the region. Within DOE, a Commercialization Task Force Study recommended coal liquefaction and gasification as candidate commercialization technologies, and three gasification projects and two liquefaction projects were designated "major systems" within the Program and Project Management System. Recently, President Carter's energy messages have given further impetus to the development of these technologies.

Participants were skeptical of the capacity of a new process (the Program and Project Management Process) to govern an ongoing program. This may be a particularly acute problem in the case of synthetic fuels because of the political pressures generated by Presidential and Congressional support for the program. Participants noted that many decisions appear to have been made without any regard for the formal process. One participant voiced a fear that "DOE has created a monster which it now cannot control."

Some participants felt strongly that technology development had progressed far beyond environmental research. They felt that this was a clear indication that the process was not working. They said that most technical environmental factors have been identified, but that not all had been dealt with satisfactorily. In particular, they felt that site-specific issues required more attention. Some participants thought that DOE simply had too much confidence that it knows the answers to environmental questions and that it should be more tentative.

Specifically, some participants questioned whether research on a pilot or demonstration scale truly represents the environmental effects of a commercial operation. The potential carcinogenic effects of synthetic fuel production was cited as a major concern, along with water and air quality, waste disposal, noise, climatic effects, social and economic impacts, and effects on property values. Participants also noted the effect on land use and asked what criteria are used in making siting decisions. Other criteria that participants felt should

be considered in examination of coal synthetic fuels were net energy and net cost, including opportunity costs. They urged that DOE compare technologies and determine where the most benefit can be derived from its investment.

Participants expressed concern over the effects that the President's proposed "fast tracking" will have on synthetic fuels research. They worried that environmental research may be cut short, and that opportunities for public participation in the process would have little chance of expanding as they have recommended.

**Public Participation in Coal Liquefaction and Gasification RD&D**

There was general agreement among participants that mechanisms for public participation and information dissemination were inadequate. Desire for a more open process was expressed by many groups, but a basic question was raised: does DOE really want public participation? Some participants expressed skepticism about this and said that if information dissemination and public participation do not appear in DOE's budget, then DOE does not perceive them as a priority.

Participants noted that the role of state and local government in the process was not clear. Participants felt that state and local governments should be more actively involved in gathering and interpreting information. Many also felt that state and local governments should be involved in decisions as to *whether* a project should occur, in addition to *where* and *how*.

Participants repeated several of the concerns expressed in the morning session: that documents should be readily available locally and in a form that the public can understand, and that active outreach is needed. They also questioned how decision makers can be held accountable when the public knows so little about their deliberations and decisions. They felt that publishing decisions would be an initial step in increasing accountability.